



Complex Child E-Magazine

www.ComplexChild.com

Normal Vital Signs in Children: Heart Rate, Respirations, Temperature, and Blood Pressure by Susan Agrawal

It is very common for parents to wonder if their children's vital signs are normal for their ages or sizes. This is particularly true for children with medical challenges who need closer monitoring. "Normal," of course, does not truly exist, but the following guidelines can give you a general idea of what is typically considered acceptable.

Heart Rate

In general, the younger and smaller the child, the higher you would expect the heart rate to be. A newborn routinely has heart rates up to the 150s with no cause for concern. As we age, the heart rate slows considerably.

You can take your child's heart rate by feeling her pulse on her wrist or foot, listening with a stethoscope, or using an electronic monitor.

Listed below are normal heart rates (beats per minute) by age. Note that these rates are for children who are resting. The heart rate may be higher during exercise or crying, and should be on the low end of the scale when sleeping.

Table 1: Normal Heart Rates (Resting)¹

| Age | Normal Range (Resting) |
|-------------|------------------------|
| Premature | 120-170 |
| 0-3 months | 100-150 |
| 3-6 months | 90-120 |
| 6-12 months | 80-120 |
| 1-3 years | 70-110 |
| 3-6 years | 65-110 |
| 6-12 years | 60-95 |
| Over age 12 | 55-85 |

Respirations

Like heart rates, respirations tend to be faster in younger children and then slow down as we age.

Respirations may be taken by observing your child's chest rise and fall, placing your hand on your child's belly and feeling the rise and fall, or using a stethoscope.

Listed below are normal respiration rates (breaths per minute) for children who are resting. Breathing may be faster during exercise or screaming and slower while asleep.

Table 2: Normal Respirations (Resting)

| Age | Normal Range (Resting) |
|-------------|------------------------|
| Premature | 40-70 |
| 0-3 months | 35-55 |
| 3-6 months | 30-45 |
| 6-12 months | 25-40 |
| 1-3 years | 20-30 |
| 3-6 years | 20-25 |
| 6-12 years | 14-22 |
| Over age 12 | 12-18 |

Temperature

Normal body temperature does not vary as much by age, though children do tend to have a wider range of normal. Expect temperatures to vary by the time of the day, especially in older children. It is also very normal for some children to always read on the low or high side of the range. 98.6F, which has long been exalted as "the normal temperature," really is not any more normal than 97.7F or 99.2F for some children.

The best way to take a temperature is rectally. Most parents obviously wish to avoid this method when possible. It is fine to take the temperature another way and then only do rectal temperatures when you suspect your child may be seriously ill. For older children, oral temperatures are reasonably reliable, and many newer thermometers allow you to take a temporal temperature (on the forehead), which is roughly equivalent to a rectal temperature.

Axillary (armpit) and ear temperatures can be notoriously inaccurate, so always obtain a rectal temperature if your child is showing symptoms of serious illness.

Listed below are normal temperatures for the most common methods of taking temperatures.

Table 3: Normal Temperatures by Age and Method

| Age | Oral | Rectal | Axillary (Armpit) | Ear |
|-------------|--------------|------------|----------------------|------------|
| 0-2 years | - | 97.9-100.4 | 94.5-99.1 | 97.5-100.4 |
| 3-10 years | 95.9 to 99.5 | 97.9-100.4 | 96.6-98.0 | 97.0-100.0 |
| Over age 11 | 97.6-99.6 | 98.6-100.6 | 95.3-98.4 | 96.6-99.7 |

Blood Pressure

Blood pressure in children works in the opposite way as compared to the other parameters in that it tends to increase as children age. Blood pressures can be quite low in newborns, and remain on the low side until children reach toddlerhood.

Blood pressures can be obtained on the leg or the arm (for children who are toddlers or older) and should be taken with the child quiet and not moving. Blood pressures can be taken with a manual cuff and stethoscope, an automatic cuff, or even an adult wrist cuff placed over the arm or leg of a child.

Listed below are normal ranges for blood pressure in children. The top number (systolic) and bottom number (diastolic) are listed separately.

Table 4: Normal Blood Pressures

| Age | Normal Range Top Number | Normal Range Bottom Number |
|-------------|----------------------------|-------------------------------|
| Premature | 55-75 | 35-45 |
| 0-3 months | 65-85 | 45-55 |
| 3-6 months | 70-90 | 50-65 |
| 6-12 months | 80-100 | 55-65 |
| 1-3 years | 90-105 | 55-70 |
| 3-6 years | 95-110 | 60-75 |
| 6-12 years | 100-120 | 60-75 |
| Over age 12 | 110-135 | 65-85 |

Your Child's "Normal"

While official guidelines are well and good, what is more important is to know your child's "normal." Most children will fall into the official normal ranges. But some children may not, and that may still be fine. The most important thing about monitoring vital signs is to detect when a change from your child's "normal" occurs. So if your child normally has a heart rate of 120 and suddenly it is 180, you know something is likely to be wrong. Similarly, if your child normally has a body temperature of 95F and it is

suddenly 99F, this could be significant, even though it technically falls into the normal range.

It is very important to establish your child's normal ranges. At a time when your child is well, take his pulse, count his respirations, and take his temperature once or twice a day. Continue this for a few days or a week to establish a pattern. If the pattern does not fall into the standard normal ranges, contact your doctor and discuss if he or she feels comfortable with your child's "normal" or if further evaluation is needed.

While some children have blood pressure monitoring available at home, many do not. If you cannot monitor at home, ask your child's doctors to check his blood pressure at each appointment so you can establish a normal range.

Finally, don't be surprised if your child's "normal" changes over time. Vital signs do change as children age and grow, and some conditions may cause dramatic changes over time. For example, two years ago my daughter had very low body temperatures, often as low as 93F, and occasionally as low as 90F. Over the past year, as she has struggled with repeated infections and inflammation, her temperatures have become more normal, or even high at times. Don't forget to reassess for changes in age, weight, or condition.

Monitoring your child's vital signs is a great way to make sure she is healthy, and is also very helpful in determining when a child is ill. Finding your child's "normal" can help keep her healthy and thriving!

¹ Charts for heart rate, respirations, and blood pressure taken from Robert M. Kliegman, *et al.*, editors, *Nelson Textbook of Pediatrics*, 18th edition (Philadelphia: Saunders Elsevier, 2007), 389.